

WHAT IS CLAIMED IS:

1. A photosensor system comprising
a photosensor array constituted by two-
dimensionally arraying a plurality of photosensors,
5 an image reader which reads a subject image at a
predetermined reading sensitivity by the photosensor
array:

sensitivity-adjusting reader which reads the
subject image while changing an image reading
10 sensitivity of the photosensor array at a plurality of
stages;

optimal image reading sensitivity extraction means
for extracting an optimal image reading sensitivity
suitable for the image reading operation on the basis
15 of a predetermined measurement amount relating to
an image pattern of the subject image read by the
sensitivity-adjusting reader; and

reading sensitivity setting means for setting
the optimal image reading sensitivity to a reading
20 sensitivity of the image reader.

2. A system according to claim 1, wherein the
sensitivity-adjusting reader reads the subject image by
setting different image reading sensitivities stepwise
for respective rows of the photosensor array.

25 3. A system according to claim 1, wherein the
sensitivity-adjusting reader reads the subject image by
setting different image reading sensitivities stepwise

for photosensors of a specific row section of one to several specific rows of the photosensor array.

4. A system according to claim 3, the photosensors of the specific row section of the
5 photosensor array are photosensors of one specific row.

5. A system according to claim 3, further comprising abnormal pixel determining means for determining whether the specific row section contain an abnormal pixel by checking whether the measurement
10 amount corresponding to one column of the specific row section has changed each time the image reading sensitivities are switched from one to another.

6. A system according to claim 5, further comprising sensitivity-adjusting read controlling means
15 for executing the sensitivity-adjusting reading operation with respect to a specific row section other than the specific row section if the abnormal pixel determining means determines that the abnormal pixel exists in the specific row section.

20 7. A system according to claim 1, wherein the predetermined measurement amount in the optimal reading sensitivity extraction means is lightness data corresponding to the image pattern of the subject image read by the sensitivity-adjusting reader.

25 8. A system according to claim 1, wherein the image reading sensitivity of the photosensor array is set by adjusting a charge accumulating period of the

photosensor.

9. A system according to claim 1, which further comprises, in the image reader and the sensitivity-adjusting reader in the photosensor array, an effective
5 voltage adjuster which applies to each photosensor a correction signal for setting to optimal values effective voltages of signal voltages applied to each photosensor.

10. A system according to claim 1, wherein the
10 optimal reading sensitivity extraction means comprises:

measurement amount comparison means for extracting maximum and minimum values of the measurement amount relating to the image pattern of the
15 subject image for each image reading sensitivity on the basis of the subject image read by a the sensitivity-adjusting reader;

dynamic range calculation means for calculating a dynamic range of the measurement amount on the basis
20 of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity;
and

maximum dynamic range extraction means for extracting an image reading sensitivity having
25 a maximum dynamic range among dynamic ranges of measurement amounts calculated for each image reading sensitivity.

11. A system according to claim 10, wherein the measurement amount comparison means extracts the maximum and minimum values of the measurement amount in a predetermined column range of each row.

5 12. A system according to claim 1, wherein the optimal reading sensitivity extraction means comprises:

displacement calculation means for calculating a displacement of the measurement amount relating to the image pattern of the subject image between image reading sensitivities on the basis of the subject image read by the sensitivity-adjusting reader; and

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maximum displacement extraction means for extracting an image reading sensitivity having a maximum displacement among displacements of measurement amounts between image reading sensitivities.

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13. A system according to claim 12, wherein the displacement calculation means calculates a differentiated value of the measurement amount on predetermined columns of each row.

20 14. A system according to claim 1, wherein the optimal reading sensitivity extraction means comprises:

measurement amount comparison means for extracting maximum and minimum values of the measurement amount relating to the image pattern of the subject image for each image reading sensitivity on the basis of the subject image read by the sensitivity-adjusting reader;

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dynamic range calculation means for calculating

a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity; and

5 maximum dynamic range extraction means for extracting an image reading sensitivity at which the dynamic range of the measurement amount for each image reading sensitivity maximizes and a displacement of the dynamic range between image reading sensitivities
10 minimizes.

15 15. A system according to claim 1, which further comprises abnormal value removing means for removing an abnormal value deviating from a main change trend of the measurement amount, from the measurement amount relating to the image pattern of the subject image read
by the sensitivity-adjusting reader.

20 16. A system according to claim 15, wherein the abnormal value removing means removes the abnormal value by performing Fourier transformation for the measurement amount and removing a predetermined high-frequency component from the frequency-converted measurement amount.

25 17. A system according to claim 1, which further comprises:

 measurement amount comparison means for extracting maximum and minimum values of the measurement amount relating to the image pattern of the subject image for

each image reading sensitivity on the basis of the
subject image read by the sensitivity-adjusting reader;

5 a dynamic range calculation means for which
calculating a dynamic range of the measurement amount
on the basis of the maximum and minimum values of the
measurement amount extracted for each image reading
sensitivity;

10 specific value extraction means for extracting
for each image reading sensitivity a specific value
at which the dynamic range of the measurement amount
for each image reading sensitivity maximizes and
a displacement of the dynamic range between image
reading sensitivities maximizes; and

15 abnormality determination means for which
determining presence/absence of an abnormality
contained in the subject image on the basis of the
specific value.

18. A system according to claim 1, wherein
20 each of the photosensors has a source electrode
and drain electrode formed via a channel region made
from a semiconductor layer, and a top gate electrode
and bottom gate electrode formed at least on and below
the channel region via insulating films,

25 either of the top gate electrode and bottom gate
electrode is used as a light irradiation side, and

charges corresponding to a light quantity
irradiated from the light irradiation side are

generated and accumulated in the channel region.

19. A drive control method for a photosensor system having a photosensor array constituted by two-dimensionally arraying a plurality of photosensors comprising :

executing a sensitivity-adjusting reading operation of reading a subject image while changing an image reading sensitivity of the photosensor array at a plurality of stages;

extracting an image reading sensitivity suitable for reading operation of the subject image on the basis of a predetermined measurement amount relating to an image pattern of the subject image read by the sensitivity-adjusting reading operation;

setting the extracted image reading sensitivity as a reading sensitivity in the reading operation of the subject image; and

executing image reading operation of reading the subject image at the set reading sensitivity.

20. A method according to claim 19, wherein the sensitivity-adjusting reading operation is executed by setting different image reading sensitivities stepwise for respective rows of the photosensor array and reading the subject image.

21. A method according to claim 19, wherein the sensitivity-adjusting reading operation is performed by reading the subject image at different image reading

sensitivities that are set stepwise for photosensors of a specific row section of one to several specific rows of the photosensor array.

22. A method according to claim 21, wherein the
5 photosensors of the specific row section of the photosensor array are photosensors of one specific row.

23. A method according to claim 21, further comprising determining whether the specific row section contain an abnormal pixel by checking whether the
10 measurement amount corresponding to one column of the specific row section has changed each time the image reading sensitivities are switched from one to another.

24. A method according to claim 23, further comprising executing the sensitivity-adjusting reading
15 operation with respect to a specific row section other than the specific row section if the abnormal pixel determining step determines that the abnormal pixel exists in the one specific row section.

25. A method according to claim 19, wherein the
20 predetermined measurement amount is lightness data corresponding to the image pattern of the subject image read by the sensitivity-adjusting reading operation.

26. A method according to claim 19, wherein the image reading sensitivity of the photosensor array is
25 set by adjusting a charge accumulating period of the photosensor.

27. A method according to claim 19, wherein the

extracting the image reading sensitivity comprises :

5 extracting maximum and minimum values of the
measurement amount relating to the image pattern of the
subject image for each image reading sensitivity on the
basis of the subject image read by the sensitivity-
adjusting reading operation;

10 calculating a dynamic range of the measurement
amount on the basis of the maximum and minimum values
of the measurement amount extracted for each image
reading sensitivity; and

 extracting an image reading sensitivity having
a maximum dynamic range among dynamic ranges of
measurement amounts calculated for each image reading
sensitivity.

15 28. A method according to claim 19, wherein the
extracting the image reading sensitivity comprises:

20 calculating a displacement of the measurement
amount relating to the image pattern of the subject
image between image reading sensitivities on the basis
of the subject image read by the sensitivity-adjusting
reading operation; and

 extracting an image reading sensitivity at which
a displacement of the measurement amount between image
reading sensitivities maximizes.

25 29. A method according to claim 19, wherein the
extracting the image reading sensitivity comprises:

 extracting maximum and minimum values of the

measurement amount relating to the image pattern of the subject image for each image reading sensitivity on the basis of the subject image read by the sensitivity-adjusting reading operation;

5 calculating a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity; and

 extracting an image reading sensitivity at which
10 the dynamic range of the measurement amount for each image reading sensitivity maximizes and a displacement of the dynamic range between image reading sensitivities minimizes.

30. A method according to claim 19, wherein the
15 extracting the image reading sensitivity comprises:

 extracting maximum and minimum values of the measurement amount relating to the image pattern of the subject image for each image reading sensitivity on the basis of the subject image read by the sensitivity-adjusting reading operation;
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 calculating a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity;

25 extracting a specific value at which the dynamic range of the measurement amount for each image reading sensitivity maximizes and a displacement of the dynamic

range between image reading sensitivities maximizes;
and

determining presence/absence of an abnormality
contained in the subject image on the basis of the
specific value.

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31. A method according to claim 19, wherein the
extracting the image reading sensitivity comprises:

removing an abnormal value deviating from a main
change trend of the measurement amount, from the
measurement amount relating to the image pattern of the
subject image for each image reading sensitivity.

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32. A method according to claim 31, wherein the
removing the abnormal value from the measurement amount
comprises:

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performing Fourier transformation for the measure-
ment amount and removing a predetermined high-frequency
component from the frequency-converted measurement
amount.

33. A method according to claim 19, wherein

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each of the photosensors has a source electrode
and drain electrode formed via a channel region made
from a semiconductor layer, and a top gate electrode
and bottom gate electrode formed at least on and below
the channel region via insulating films,

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either of the top gate electrode and bottom gate
electrode is used as a light irradiation side, and
charges corresponding to a light quantity.

irradiated from the light irradiation side are generated and accumulated in the channel region.